

WHAT IS CLAIMED IS:

1. A charging system for a vehicle, comprising:

a motor generator which operates as a generator to generate an alternating current when said motor generator is driven  
5 by an internal combustion engine, and operates as a motor when the alternating current is supplied thereto;

a switching circuit for converting the alternating current generated by said motor generator into a direct current;

10 a first accumulator accumulating therein the direct current converted by said switching circuit;

a second accumulator accumulating therein the direct current converted by said switching circuit and having a smaller accumulation voltage than that of said first accumulator;

15 a first opening/closing unit interposed between said first accumulator and said switching circuit;

a second opening/closing unit interposed between said second accumulator and said switching circuit; and,

a control unit for controlling the opening and closing of said first and second opening/closing units.

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2. A charging system for a vehicle as set forth in Claim 1, wherein said first opening/closing unit comprises:

25 a first transistor having a collector connected to a positive terminal of said first accumulator and an emitter connected to a positive-side input/output terminal of said switching circuit; and

a diode disposed in parallel to said first transistor for allowing a current to flow therethrough in a direction from said positive-side input/output terminal of said switching circuit toward said positive terminal of said first accumulator,

5 and,

wherein said second opening/closing unit comprises:

a second transistor having a collector connected to said positive-side input/output terminal of said switching circuit; and

10 a reverse current preventive diode connected between the emitter of said second transistor and said positive terminal of said second accumulator for preventing a current from flowing in a direction from the positive terminal of said second accumulator toward said emitter of said second transistor.

15 3. A charging system for a vehicle as set forth in Claim 1, wherein said control unit comprises:

a drive mode for driving said motor generator using said first accumulator;

20 a first accumulating mode for accumulating electric power generated by said motor generator in said first accumulator; and

a second accumulating mode for accumulating electric power generated by said motor generator in said second accumulator,

25 and

wherein, in said drive mode, said first opening/closing

unit is held in a closed state and said second opening/closing unit is held in an opened state,

further wherein, in said first accumulating mode, said first and second opening/closing units are both held in an opened state, and,

further wherein, in said second accumulating mode, said first opening/closing unit is held in an opened state and said second opening/closing unit is held in a closed state.

4. A charging system for a vehicle as set forth in Claim 1, further comprising:

a voltage detect unit for detecting the accumulated voltages of said first and second accumulators;

wherein said control unit controls the electric energization rate of said switching circuit according to the deviation of the detected voltage detected by said voltage detect unit from a previously set reference voltage.

5. A charging system for a vehicle as set forth in Claim 1, further comprising:

a smoothing condenser connected between the positive-side input/output terminal of said switching circuit and a grounding terminal,

wherein said control unit includes a pre-charge mode for opening and closing said first opening/closing unit with a previously set electric energization rate so as to charge said

smoothing condenser.

6. A charging system for a vehicle as set forth in Claim 1, further comprising:

5 a smoothing condenser connected between the positive-side input/output terminal of said switching circuit and a grounding terminal,

10 wherein said control unit includes a discharge mode for opening and closing said second opening/closing unit with a previously set electric energization rate so as to discharge said smoothing condenser.

7. A charging system for a vehicle as set forth in Claim 5, further comprising:

15 a current detect unit for detecting an input current to said switching circuit,

20 wherein said control unit controls the electric energization rate of said first opening/closing unit according to the deviation of a detected current value detected by said current detect unit from a previously set reference current value.

8. A charging system for a vehicle as set forth in Claim 6, further comprising:

25 a current detect unit for detecting an input current to said switching circuit,

